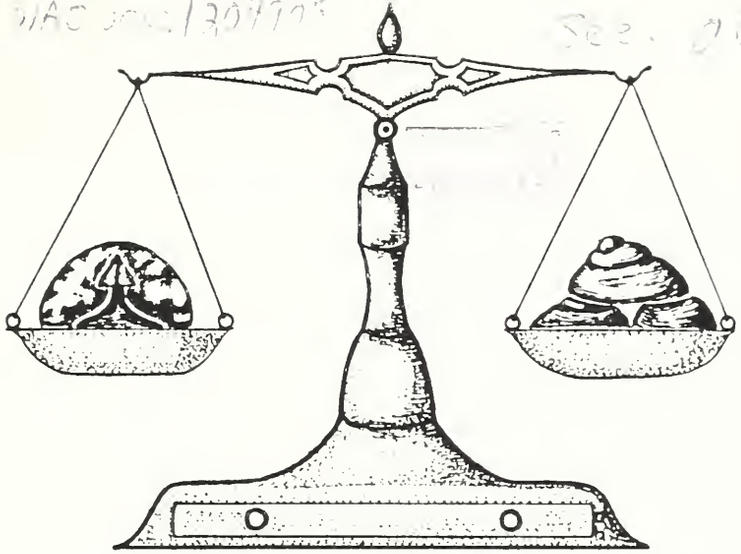
THE SCALE



Editor:
Douglass R. Miller
Systematic
Entomology Lab.
Bldg. 003, Rm. 1
Beltsville, MD,
USA, 20705

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A LIST OF THE COCCOIDEA MATERIAL DEPOSITED IN THE "MUSEUM FUR NATURKUNDE BERLIN" (G.D.R.) PART I - ALCOHOL MATERIAL

by
G. Kohler
Friedrich-Schiller-Universität Jena
Neugasse 23, DDR-69
and
U. Gollner-Scheiding
Museum für Naturkunde
der Humboldt-Universität Berlin
Bereich Zoologisches Museum
Invalidenstr. 43, DDR-104

The alcohol-preserved Coccoidea specimens in the Museum of Natural History, Berlin primarily include material collected between 1898 and 1912. There are 270 alcohol containers that entail scale insects in 13 families from 31 countries on all continents. There are 67 containers from Germany, 60 from Brazil, 41 from Tanzania, and 23 from Papua-New Guinea.

The Brazilian specimens include material determined by Hempel, some of which are labeled as "types" or "cotypes". Hempel's specimens were described in one of the following 7 publications:

1898: Notas sobre Capulinia jaboticabae Ihering.-Rev. Mus. Paul. 3, 51-61;
1899: Two new Coccidae of the subfamily Lecaniinae.-Can. Ent. 31, 131-133;
1900: Description of three new species of Coccidae from Brazil.-Can. Ent. 32, 3-7;
1900: As Coccidas Brazileiras.-Rev. Mus. Paul. 4, 365-537;
1900: Descriptions of Brazilian Coccidae.-Ann. Mag. Nat. Hist. (ser. 7) 6, 389-398;
1901: Descriptions of Brazilian Coccidae.-Ann. Mag. Nat. Hist. (ser.7) 7, 110-125, 206-219, 556-561;
1901: Descriptions of Brazilian Coccidae.-Ann. Mag. Nat. Hist. (ser. 7) 8, 62-72, 100-111.

The entire alcohol collection includes 57 "types" or "cotypes", including many from Newstead. Evidently, these are not types in the true systematic sense, but are additional specimens fron the type series. More information will be provided when the slide-mounted specimens are catalogued.

Part of the Coccoidea material was used by Newstead (On a collection of Coccidae and the Aleurodidae, chiefly African, in the collection of the Berlin Zoological Museum.-Berlin. Zool. Mus. Mitt. 5, 155-174, 1911) and Lindinger (Afrikanische Schildlause I, 1909-V, 1913.-Jahrb. Hamb. Wiss. Anst. 26,27,28,30 and Hamb. Bot. Staatsinst. Abt. f. Pfl. schutz 11).

The original spelling of the genus and species has been retained; this sometimes has caused the appearance of the same species in different areas of the list under different generic names. Mistakes in the spelling were corrected when detected. Names of countries have been adapted to the most recent denotations except for those from "Germany". In many instances the "Germany" material lacks detailed locality data. In these cases the original names are used verbatim from the label.

Requests for loans of Coccoidea material should be sent to:
Dr. U. Gollner-Scheiding (see address on previous page).

Abbreviations: t - "type", c - "cotype", i - on imported fruits, g - from greenhouses, (2) - number of alcohol containers, ? - unknown (country or not sure (genus, species).
A - Asterolecaniidae, C - Coccidae, Cer - Cerococcidae, Da - Dactylopiidae, Di - Diaspididae, E - Eriococcidae, K - Kermesidae, L - Lecanodiaspididae, M - Margarodidae, O - Ortheziidae, P - Pseudococcidae, S - Stictococcidae, T - Tachardiidae.

Aonidiella aurantii (Maskell)	Namibia	Di	
Apiococcus gregarius Hempel	Brazil	E	
Apiomorpha (Brachyscelis) sp.	Australia (Victoria)	E	
Aspidiotus (Chrysomphalus) aurantii Maskell (= Aonidiella)	Tanzania (2), Namibia	Di	
Aspidiotus camelliae Sign.(=Hem. rapax)	Brazil	Di	
Aspitiotus destructor Sign.	Tanzania (4), Papua-New Guinea (4), Pacific Islands, Carolinen (2), Togo	Di	
Aspidiotus (Diaspis) fallax Horvath (=Epid. leperii)	?	Di	
Aspidiotus ficus Ashm.(=Chry. aonidum)	Germany (i)	Di	
Aspidiotus hederae Vallot	Germany (3), Tanzania	Di	
Aspidiotus paulistus Hempel (=Melanaspis)	Brazil	Di	t
Aspidiotus reticulatus Newst. (=Separaspis capensis)	South Africa	Di	c
Aspidiotus scutiformis Ckll. (=Acutaspis)	Brazil	Di	
Aspidiotus trilobitiformis Green (=Pseudaonidia)	Tanzania (2)	Di	
Aspidoproctus armatus Newst.	Tanzania	M	t,c
Aspidoproctus maximus Lounsbury	Tanzania, Simbabwe	M	
Aspidoproctus pertinax (Newst.)	Tanzania	M	
Asterolecanium coffeae Newst.	Tanzania (2)	A	t,c
Asterolecanium massalongianum Targ.-Tozz. (=A. arabidis)	Germany (2)	A	
Asterolecanium quercicola (Bouché)	Germany	A	
Aulacaspis rosae (Bouché)	?	Di	
Aulacaspis	Mauritius	Di	

Capulinia crateraformans Hempel	Brazil	E	t
Capulinia jaboticabae Ihering	Brazil	E	t
Carporholoroides viridis Ckll.	Brazil		
Ceroplastes ceriferus (Fabricius)	Tanzania (2)	C	
Ceroplastes communis Hempel	Brazil	C	t
Ceroplastes confluens Ckll. & Tinsley	Brazil	C	
Ceroplastes cuneatus Hempel	Brazil	C	t
Ceroplastes egbarum Ckll.	Tanzania	C	
Ceroplastes floridensis Comst.	Brazil	C	
Ceroplastes formicarius Hempel	Brazil	C	t
Ceroplastes grandis Hempel	Brazil	C	t
Ceroplastes iheringi Ckll.	Brazil	C	
Ceroplastes janeirensis (Gray)	Brazil	C	
Ceroplastes lucidus Hempel	Brazil	C	t
Ceroplastes mimosae Sign.	Egypt	C	
Ceroplastes noraesi Hempel	Brazil	C	t
Ceroplastes purpureus Hempel	Brazil	C	t
Ceroplastes rubens Mask.	Australia	C	
Ceroplastes rusci (L.)	Tanzania	C	
Ceroplastes ? sp.	Cameroon	C	
Ceroplastes speciosus Hempel	Brazil	C	t
Ceroplastes subsphaericus Newst.	Tanzania	C	c
Ceroplastes variegatus Hempel	Brazil	C	t
Chionaspis africana Newst. (=Gramenaspis)	South Africa	Di	
Chionaspis bussei Newst.(=Daraspis)	Guinea	Di	
Chionaspis furfura (Fitch)	Germany	Di	
Chionaspis lutea Newst.	Tanzania	Di	
Chionaspis mytilaspiformis Newst. (=Tecaspis)	South Africa	Di	
Chionaspis nudata Newst.(=Augulaspis)	Tanzania	Di	t,c
Chionaspis populi Baerenspr.	Germany	Di	
Chionaspis salicis (L.)	Germany (2)	Di	
Chionaspis subnudata Newst. (=Contigaspis)	South Africa	Di	
Chrysomphalus dictyospermi (Morgan)	Brazil	Di	
Chrysomphalus ficus Ashm.(=C. aonidum)	Papua-New Guinea	Di	
Coccus cacti L. (= Dactylopius coccus)	Canary Isl. (2), Cap ?	Da	
Coccus vitis L. (=Pulvinaria)	Germany	C	
Coelostoma (Coccus)?	Australia (S-Austr.)	C	
Crypticerya hempeli Ckll.(=Mimosicerya)	Brazil	M	t
Cryptococcus fagi (Baerensp.) (=C. fagisuga)	Germany	E	
Cryptokermes brasiliensis Hempel	Brazil	M	t
Dactylopius (Pseudococcus) citri Risso (=Planococcus)	Madagascar (2), Samoa	P	
Dactylopius coccus Costa	Mexico	Da	
Dactylopius longifilis Comst. (=Pseudococcus longispinus)	Germany, g(2)	P	
Dactylopius longispinus Targ.-Tozz. (=Pseudococcus)	Tanzania	P	
Dactylopius (Pseudococcus) obtusus Newst. (=Rastrococcus iceryoides)	Tanzania (2)	P	
Dactylopius tomentosus Lamarck (= Coccus tomentosus Lamarck)	Canary Isl. (2)	Da	

Dactylopius (Pseudococcus) virgatus Ckll.	Cameroon	P	
Dactylopius (Pseudococcus) virgatus	Tanzania, Pacific Isl.	P	
	Madagascar		t
Dactylopius sp. (indet.)	Pacific Isl. (Carolines), Canary Isl., Papua-New Guinea (5) Tanzania	P	
Diaspiditis multilobis Hempel	Brazil	Di	t
Diaspis australis Hempel	Brazil	Di	t
Diaspis pentagona Targ.-Tozz. (=Pseudaulacaspis)	Argentina	Di	
Dorthesia urticae (L.)(=Orthezia)	Germany (2)	O	
Edwallia rugosa Hempel	Brazil	C	
Eriococcus armatus Hempel(=Erium)	Brazil	P	t
Eriococcus brasiliensis Ckll.	Brazil	E	t
Eriococcus perplexus Hempel	Brazil	E	t
Eriopeltis festucae (Fonsc.)	Germany (2), Poland	C	
Eriopeltis lichtensteini Sign.	Germany (4)	C	
Eulecanium capreae (L.)	Germany		
Fiorina sp. (Fiorinia)	Namibia	Di	
Gascardia madagascariensis Targ.-Tozz.	Madagascar	Di	
Gossyparia spuria Modeer=(G. ulmi)	Germany (2)	E	
Hemichionaspis(Chionaspis)aspidistrae Sign. (=Pinnaspis)	Germany, ?g	Di	
Hemichionaspis minor Maskell (=Pinnaspis strachani)	Brazil	Di	
Icerya (?) aegyptiaca (Douglas)	Tanzania	M	
Icerya brasiliensis Hempel	Brazil	M	t
Icerya longisetosa Newst.	Kenia (2), Tanzania	M	t,c
Icerya mirabilis var. tricornis Newst.	South Africa	M	t
Icerya purchasi Mask.	Turkey	M	
Icerya seychellarum (Westw.)	Seychelles (2)	M	
Icerya seychellarum v. cristata Newst.	Madagascar, Comores Isl.	M	t
Icerya sp.	Central Africa	M	t(?)
Icerya (?) sp.	Papua-New Guinea	M	
Kermes quercus (L.)	Germany	K	
Lecanium (Eulecanium) aremae Newst.	Tanzania	C	t,c
Lecanium discoides Hempel(=Saissetia)	Brazil	C	t
Lecanium durum Hempel(=Saissetia)	Brazil	C	t
Lecanium eugeniae Hempel(=Eulecanium)	Brazil	C	t
Lecanium hemisphaericum Targ.-Tozz. (=Saissetia coffeae)	Papua-New Guinea (3) Canary Isl.	C	
Lecanium hesperidum (L.)(=Coccus)	Tanzania (2)	C	
Lecanium hirsutum Newst.	Papua-New Guinea (3)	C	
Lecanium mayteni Hempel(Mesolecanium)	Brazil	C	
Lecanium nicotianae Newst.(=Pulvinaria grabhami) (+Planococcus citri)	Madagarcar (2)	C P	t
Lecanium obscurum Hempel	Brazil	C	t
Lecanium (Saissetia) oleae (Bern.)	Tanzania	C	
Lecanium ornatum Hempel	Brazil	C	
Lecanium oxyacantha vulgare Forst.	Germany	C	
Lecanium perconvexum Hempel	Brazil	C	
Lecanium (Eulecanium) persicae var. ribis	New Zealand	C	

Lecanium pseudosemen. Ckll.	Brazil	C	
Lecanium rampomanesiae Hempel	Brazil	C	t
Lecanium sp.	Canary Isl.	C	
Lecanium sp.	Papua-New Guinea (2)	C	
Lecanium sp.	Tanzania	C	
Lecanium sp.	Pacific Isl. (Carolines)	C	
Lecanium (Saissetia) sp.	Cameroon	C	
Lecanodiaspis rugosa Hempel	Brazil	L	
Lepidosaphes beckii (Newman)	?	Di	
(+ Mytilaspis citricola)		Di	
Lepidosaphes gloverii (Pack.)	German (i)	Di	
(+ Lepidosaphes machili Mask. & Chrysomphalus dictyospermi Morg.)		Di	
Lepidosaphes gloverii (Pack.)	Papua-New Guinea	Di	
Lepidosaphes mcgregori Banks	Papua-New Guinea	Di	
Leucaspis sulci Newst.(=Anamaspis lowi)	Germany	Di	
(+ Lepidosaphes (Mytilaspis) newsteadi Sulc)		Di	
Lichtensia ? attenuata Hempel (=Alichtensia)	Brazil		t
Luzulaspis luzulae (Dufour)	G.D.R.	C	
Margarodes(Porphyrophora)polonicus(L.)	Germany	M	
Monophlebus africanus Newst. (=Monophleboides)	Namibia (4)	M	t,c
Monophlebus burmeisteri Westw. (=Drosicha)	Taiwan (3)	M	
Monophlebus schultzei Newst.	Papua-New Guinea	M	
Monophlebus (Perissopneumon) sp.	Tanzania	M	
Monophlebus sp.	Australia	M	
Mytilaspis bambusicola Ckll. (=Kuwanaspis)	Brazil	Di	
Mytilaspis citricola Pack.(=L. beckii)	Germany (i)(5)	Di	
Mytilaspis citricola Pack.(=L. beckii)	Germany (i)	Di	
(+ M. gloverii Pack.)		Di	
Mytilaspis (Lepidosaphes) citricola (=L. beckii)	Tanzania (2), Germany (i)	Di	
Mytilaspis citricola Pack.(=L. beckii)	Germany (i)	Di	
(+ Parlatoria zizyphi Lucas)		Di	
Mytilaspis citricola Pack.	Madagascar	Di	
(+Icerya seychellarum)		M	
Mytilaspis gloverii Pack.	Germany (i)(2)	Di	
Mytilaspis perlonga (Ckll.) (=Lepidosaphes)	Brazil	Di	
Mytilaspis pomorum Bouché(=Lep. ulmi)	Germany (3)	Di	
Ortheziola vejdovskyi Sulc	Yugoslavia	O	
Palaeococcus fuscipennis (Burmeister)	Germany (4)	M	
Palaeococcus sp. (? Icerya sp.)	Papua-New Guinea	M	
Paralecanium expansum v. quadratum Green	Sri Lanka	C	
Parlatoria pergandii Comst.	Germany (i)(3)	Di	
Parlatoria pergandii Comst.	Germany (i)	Di	
(+ Lepidosaphes beckii)		Di	
Parlatoria ziziphi (Lucas)	Germany (i)(4)	Di	
Perissopneumon zimmermanni Newst.	Tanzania	M	t,c
Phenacoccus insolitus Green	Kenia	P	
Phenacoccus mespili (Geoffr.)	Germany	P	
Platinglisia noacki Ckll.	Brazil	C	

Protopulvinaria convexa Hempel (+ Chionaspis sp.)	Brazil	C Di	t
Pseudaonidia trilobitiformis (Green)	Brazil	Di	
Pseudischnaspis linearis Hempel (=P. bowreyi)	Brazil	Di	t
Pseudococcus(Dactylopius)bromeliae (Bouché)(=Dysm. brevipes)	Madeira	P	
Pseudococcus(Dactylopius)citri (Risso)	Canary Isl., Germany (g)(2)	P	
Pseudococcus(Dactylopius)ficus (Sign.) (=Planococcus)	Madeira	P	
Pseudococcus(Dactylopius)obtusus Newst. (=Rastrococcus iceryoides)	Tanzania	P	t,c
Pseudokermes nitens (Ckll.)	Brazil		
Pseudoparlatoria parlatorioides(Comst.)	Brazil	Di	
Pulvinaria eugeniae Hempel	Brazil	C	t
Pulvinaria ficus Hempel	Brazil	C	
Pulvinaria psidii Maskell	Tanzania	C	
Pulvinaria tremulae Sign.	Germany	C	
Pulvinaria vitis (L.)	Germany	C	
Pulvinaria sp.	Germany (3)	C	
Rhizococcus multispinosus (Kuhlgatz) (=Eriococcus)	Germany (g)	E	t
Ripersia glandulifera Newst. (=Paraputo)	Namibia	P	t
Solenococcus baccharidis Hempel (=Cerococcus)	Brazil	Cer	t
Stictococcus dimorphus Newst. (=Parastictococcus multispinosus)	Tanzania	S	t,c
Stictococcus multispinosus Newst. (=Parastictococcus)	Togo	S	
Stictococcus sjostedti Ckll.	Togo, Cameroon (2)	S	
Stigmacoccus asper Hempel	Brazil	M	t
Tachardia ingae Hempel	Brazil	T	t
Tachardia parva Hempel (=Tachardiella)	Brazil	T	t
Tachardia rosae Hempel (=Tachardiella)	Brazil	T	
Tachardia rubra Hempel	Brazil	T	
Tachardia sp.	Namibia	T	
Tectococcus ovatus Hempel	Brazil	P	t
Tectopulvinaria albata Hempel	Brazil	C	t

The editor has inserted parenthetical statements when it seemed important to give the current placement of a paricular species. Parentheses have been included around author's names when appropriate, and unpublished manuscript names have been eliminated and included in the "sp." category. It is important to note that the authors should not be held responsible for editorial changes.

RECENT LITERATURE

by Douglass R. Miller
Systematic Entomology Laboratory, IIBIII, Agricultural Research Service, USDA, Beltsville, Maryland

I wish again to express my sincere appreciation to Mrs Helen Proctor for her patience and fortitude in preparing the first draft of this long list of publications. I also am grateful to Judy Miller who spent several days helping edit the list. It is a tedious and thankless task; I am sure that we all appreciate their efforts on our behalf.

The following publications are those received since the last "Scale" was sent out in November 1983. The list also includes references gathered from a "current awareness" computerized literature search provided by the U. S. Department of Agriculture. If you are aware of papers published in 1983-1984 that are not included in this issue or the previous one, please let me know. Please continue to send reprints of your papers for assurance of inclusion in the "Scale".

ABDUL AHAD, I.; JASSIM, H. K. 1983
THE LIFE CYCLE OF PARLATORIA BLANCHARDI (TARG.)(DIASPIDIDAE: HOMOPTERA). ARAB J PLANT PROT 1(1): 22-24 AR EN

ABRAMOVIC, T. 1980
CONTRIBUTION TO THE STUDY OF SCALE BUGS ON APPLE- AND PEACH-TREES IN THE REGIONAL TERRITORY OF BELGRAD - INTERIM REPORT. ARHIV POLJOPR NAUK 41(143): 523-529. SERBO-CROATIAN (SUMM EN)

ALAYO SOTO, R.; BLAHUTIAK, A. 1981
DINAMICA ESTACIONAL DE LOS PARASITOS, DEPREDADORES, Y HONGOS ENTOMOPATHOGENOS QUE ATACAN A SAISSETIA HEMISPHAERICA TARG. (HOMOPTERA: COCCOIDEA) EN CUBA INFORME CIENT. TEC. ACAD. CIENC. CUBA 182: 1-38 SP (SUMM EN)

*ALAYO SOTO, R.; BLAHUTIAK, A. 1981
PARASITES AND PREDATORS THAT ATTACK SAISSETIA HEMISPHAERICA (HOMOPTERA: COCCOIDEA) IN CUBA. POEYANA INST ZOOL ACAD CIENC CUBA 0(226): 1-4 SP

ALAYO SOTO, R.; BLAHUTIAK, A. 1982
ENTOMO PATHOGENIC FUNGI THAT ATTACK SAISSETIA HEMISPHAERICA (HOMOPTERA: COCCOIDEA) IN CUBA. POEYANA INST ZOOL ACAD CIENC CUBA 0(240): 1-5 SP

*ALEXANDRAKIS, V.; BENASSY, C. 1982
INFLUENCE OF THE HOST PLANT OLIVE ON THE POPULATION DYNAMICS OF ASPIDIOTUS NERII (HOMOPTERA: DIASPIDIDAE). AGRONOMIE 2(9): 843-850 FR

*ALEXANDRAKIS, V.; BENASSY, C. 1983
LE PROBLEM ASPIDIOTUS NERII BOUCHE (HOMOPTERA, DIASPIDIDAE EN CRETE: EXEMPLE RECENT DE PULLATION PROVOQUEE. FRUITS 34(9): 535-541

ALI, M. 1981
MORPHOLOGY AND SOME ASPECTS OF BIOLOGY AND BEHAVIOUR OF THE PARASITE, ANYSIS ALCOCKI ASHM. (TRIDYMIDAE: CHALCIDOIDEA). BANGLADESH J. ZOOL 9(2): 97-107

ALI, M. 1982
PARASITES OF THE YELLOW SCALE CEROCOCCUS-HIBISCI (HOMOPTERA: COCCIDAE) AND THEIR FREQUENCY OF PARASITISM. BANGLADESH J ZOOL 10(2): 126-130

ALI, A. M.; ABOU-GHADIR, M. F.; SALMAN, A. G. A.: EL SAYED, A. M. K.; MANNAA, S. H. 1983
EVALUATION OF INSECTICIDES AND TIME OF THEIR APPLICATION FOR CONTROL OF THE RED AND BLACK SCALE INSECTS ON ORANGE TREES IN ASSIUT, UPPER EGYPT. BULL ENTOMOL SOC EGYPT 11: 173-180

ALSTAD, D. N.; EDMUNDS, G. F., JR. 1983
ADAPTATION, HOST SPECIFICITY, AND GENE FLOW IN THE BLACK PINELEAF SCALE [NUCULASPIS CALIFORNICA, PEST OF PINUS SPP AND PSEUDOTSUGA MENZIESII]. IN: VARIABLE PLANTS AND HERBIVORES IN NATURAL AND MANAGED SYSTEMS. R. F. DENNO; M. S. MCCLURE, EDS. 413-326

ALSTAD, D. N.; EDMUNDS, G. F., JR.; JOHNSON, S. C. 1980
HOST ADAPTATION, SEX RATIO, AND FLIGHT ACTIVITY IN MALE BLACK PINELEAF SCALE. ANN ENT SOC AM 73(6): 665-667

ANNUAL REPORT 1980
INDIA, SUGARCANE BREEDING INSTITUTE. 162 PP

ANNUAL REPORT 1982
INTL INST TROP AGRIC VI (PMB 5320, IBADAN, NIGERIA) 178 PP

ANNUAL REPORT 1982
REPORT, JUTE AGRIC RES INST. 177 PP

ANNUAL REPORT 1982
REPORT, MAURITIUS SUGAR IND RES INST. 76 PP

ANON. 1981
OIL PALM AND COCONUT PESTS IN WEST AFRICA. OLEAGINEUX 36(4): 168-228

ARGYRIOU, L. C.; KOURMADAS, A. L. 1981
TIMING FOR THE CONTROL OF DIASPIDIDAE SCALES OF OLIVE TREES. ANN INST PHYTOPATHOL BENAKI 13(1): 65-72

ATKINSON, P. R. 1983
ESTIMATES OF NATURAL MORTALITY RELATED TO ENVIRONMENTAL FACTORS IN A POPULATION OF CITRUS RED SCALE AONIDIELLA AURANTII (MASKELL) (HEMIPTERA: DIASPIDIDAE) BULL ENT RES 73(2): 239-258

ATKINSON, P. R. 1983
ENVIRONMENTAL FACTORS ASSOCIATED WITH FLUCTUATIONS IN THE NUMBERS OF NATURAL ENEMIES OF A POPULATION OF CITRUS RED SCALE AONIDIELLA AURANTII (MASKELL)(HEMIPTERA: HOMOPTERA: DIASPIDIDAE). BULL ENTOMOL RES 73(3): 417-426

AULD, B. A.; HOSKING, J.; MCFAYDEN, R. E. 1982/1983
ANALYSIS OF THE SPREAD OF TIGER PEAR AND PARTHENIUM WEED IN AUSTRALIA. AUSTRALIAN WEEDS 2(2): 56-60

AVASTHI, R. K.; SHAFEE, S. A. 1982
HELIOCOCCUS SINGULARIS NEW SPECIES (COCCOIDEA: PSEUDOCOCCIDAE) FROM SOUTH INDIA. CURR SCI 51(6): 306-308

AVASTHI, R. K.; SHAFEE, S. A. 1983
A NEW SPECIES OF RASTROCOCCUS FERRIS (HOMOPTERA: PSEUDOCOCCIDAE) FROM INDIA. ENTOMOL MON MAG 119(1428/1431): 103-104

AZHAR, I. 1983
SOME PRELIMINARY OBSERVATIONS ON THE ECOLOGY OF SELECTED COCOA PESTS IN WEST MALAYSIA. MAPPS NEWSLETTER 7(1): 15

BABAYAN, G. A.; OHANESYAN, S. B. 1983
ON THE MECHANISM OF ACTION OF THE COMSTOCK MEALYBUG IN LEAVES OF MULBERRY. BIOL ZH ARMENII 36(4): 344-345 RU

BABUJEE, C. R.; RAMAN, A. 1982
ON THE DEVELOPMENTAL MORPHOLOGY OF SOME ABNORMAL STOMATAL TYPES IN THE LEAF GALLS OF BARLERIA PRIONOITIS LINN. (ACANTHACEAE) INDUCED BY FERISINA VIRGATA (COCCIDAE: INSECTA). CURRENT SCI 51(9): 471-472

BACCETTI, B.; BURRINI, A. G.; DALLAI, R.; PALLINI, V. 1982
A MOTILE SYSTEM OF SINGLET MICRO TUBULES IN SPERMATOZOA. CARYOLOGIA 35(1): 126

BALEVSKI, A.; TSALEV, M.; VASEV, A.; PELOV, V.; ZAPRYANOV, A.; SIMOVA, S. 1982
ROCK OILS (PETEROLEUMS) AS A MEANS OF CONTROLLING PESTS ON FRUIT TREES AND OTHER AGRICULTURAL PLANTS. SELSKOSTOPANSKA NAUKA 20(5): 81-92 BG

BATTAGLIA, D.; VIGGIANI, G. 1982
OBSERVATIONS ON THE DISTRIBUTION AND PHENOLOGY OF AONIDIELLA AURANTII (MASK) (HOMOPTERA: DIASPIDIDAE) AND ON ITS NATURAL ENEMIES IN CAMPANIA. ANNALI DELLA FACOLTA DI SCIENZE AGRARIE DELLA UNIVERSITA DEGLI STUDI DI NAPOLI, PORTICI 16(2): 125-132 IT EN

BAZAROV, B. B. 1984
A NEW SPECIES OF THE GENUS NEOTRIONYMUS BORCHS. (HOMOPTERA: COCCIDEA: PSEUDOCOCCIDAE) FROM KIRGHIZIA. DOKLADY AKAD NAUK TADZHIK SSR 24(4): 262-264 RU

BAZAROV, B. B.; BABAEVA, Z. 1981
A NEW SPECIES OF THE GENUS PELIOCOCCUS BORCHS. (HOMOPTERA, COCCOIDEA, PSEUDOCOCCIDAE) FROM TAJIKISTAN. DOKLADY AKAD NAUK TADZHIK SSR 24(5): 323-325. RU (SUMM: TADZHIK)

BEARDSLEY, J. W., JR. 1982
TAXONOMY OF THE GENUS PSEUDOPSYLLA WITH A REDESCRIPTION OF THE TYPE SPECIES (HOMOPTERA: COCCOIDEA). PROC HA ENTOM 24(1): 31-36

BEARDSLEY, J. W., JR.; SU, T. H.; MCEWEN, F. L.: GERLING, D. 1982
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OBITUARIES

Prof. Dr. Zbigniew Kawecki (1908-1981)

On January 29, 1981 Professor Zbigniew Kawecki the outstanding Polish zoologist and creator of the Polish School of Coccidology died in Warsaw. During his career he wrote 130 scholarly publications in many fields of zoology.

He was born on March 26, 1908, in Jaworzno. He studied in Jagiellonian University, where, in 1933 he received a diploma of Magister and, in the same year, the degree of Doctor in Zoology.

During the period of 1929-45 he managed the Plant Protection Stations in Krakow, Kielce, and Radom. From 1948-58 he worked in Krakow in UJ, Agricultural Academy and Pedagogical Univesity; afterwards in 1958, already as a professor, he went to Warsaw where he became a director of the Zoology Institute of SGGW. He retired in 1978.

Scientific and didactic activities

The broad interests of Professor Kawecki permitted him to apply himself to the study of various scientific disciplines. His first phase of interest takes its origin from the period when he was associated with the Plant Protection Stations. He was concerned with the plant pests of diverse systematic groups such as insects and rodents; also he studied the role of moles in the agrocenosis. The publications of this period deal with the biology and morphology of pests (1932, 1934, 1936, 1938, 1948) and with the methods of controlling them. He led educational programs for farmers and orchardists on the subject of the need to control the diseases and pests of plants. Already as a young researcher, Professor Kawecki closely united theory with practice. He registered the pests, made observations on them, gave historical accounts of the species, estimated the level of damage, and advised on ways of control.

The second phase of Dr. Kawecki's interest was in nature preservation. Many of his works in this field are connected with the former ones, e.g. protection of beneficial birds (1933, 1935, 1936, 1938, 1939). Some of these works are concerned with historical and legal documents which derived from the work of the Galician Parliament. The pride of national tradition was often reflected in the papers of Professor Kawecki. Three of his papers (1972) are dedicated to the royan animal - bison, Bos primigenius Bojanus. These papers were written as the result of his deep interest in national history and natural sciences. He expressed the view that the survival of bison in Poland till 1626 is owed to the special attention dedicated to them by Polish monarchs. The profound patriotism of the Professor is marked in all papers concerned with Polish natural science achievements and also with Polish biologists. He wrote biographical monographs and reminiscences of the later Professors, particularly his own collaborators with the strong will to commemorate them for posterity. He always drew attention to the high moral accomplishments of the persons that he was writing about. The most detailed and extensive such monograph concerned Maksymilian Nowicki (1950, 1962), who

had a special fascination for Prof. Kawecki. In the monograph he writes about the life and activities of Nowicki as a pioneer in the field of the protection of Polish nature, esteemed didactic, investigator and lover of nature.

However, the scale insects were Prof. Kawecki's greatest passion. This phase of his interest brought forth many noteworthy acheivements, i.e. Polish School of Coccidology with two research centers; in Cracow and Warsaw. The Professor's interest in this group of insects with their complicated development and great morphological variety was derived from his activities in the Plant Protection Stations. Initially, scale insects were only one element in plant protection process, but later they became the source of a searching passion which culminated in the "Catalogue of the Insects Fauna" / in print/. Until Kawecki started his investigations on the scale insects, the Polish fauna included only about 40 of the most common species - mostly living on the trees and shrubs. His works and those of collaborators added significantly to that number, which now comes to 159 known species (including the greenhouse species).

His first paper on scale insects is from 1933. It deals with one of the most important cosmopolitan scale pests - Quadraspidiotus perniciosus (Comst.). The damage done by this insect has been estimated as being greater than the damage caused by all orchard pests together. San José scale absorbed the attention of Professor Kawecki for many years /1935, 1938, 1950, 1953/. He warned of the possibility of introducing the species to Poland and of its potential acclimatization in our country. In 1948, he was leading the search for this armored scale insect on order of the then Ministry of Agriculture. Two infestations were found in the area of Wadowice. A beautiful monograph of this armored scale insect contains the results of this inspection.

A series of papers about scale insects concerned the physiographical studies; this research added significant information to our knowledge of the native? species, e.g.: "Scale insects of Krakow and Kielce County" /1935/, "Scale insects of Poland, the outline "/1948/, "Scale insects of Tatra Mountains"/1936/ etc.

Prof. Kawecki spent considerable effort on studies of "the most Polish insect", Porphyrophora polonica (L.)/1950/. This fascinating margarodid, was an excellent source of red dye and was a major export from our country during the Middle Ages and Renaissance. The profits from "dye grain" was larger than profits realized from major crops. Professor Kawecki studied the biological and morphological characteristics of the species, was interested in its disposal in Poland, also he tried, with collaborators /H. Wernerowna/ to find practical uses of the dye at present. As usual, where the "especially Polish" species was concerned Prof. Kawecki went to another of his greatest loves, history. Together with Miss Werner/1969/ he reedited the paper of Breynius, which contained detailed descriptions of the Polish scale insect and its economic importance. He considered Breynius' research to be some of the best developed before the time of Linneaus.

Studies on the genus Lecanium Burm. /1951, 1954, 1955, 1958/ 1961/ 1962, 1967 / provided distinguishing characters for four of the most often confused species /L. corni Bouché, L. rufulum Ckll., L. fletcheri Ckll., L. pomeranicum Kaw./ and also gave descriptions for three species new to science/ L. pomeranicum, L. smreczynskii, L. slavum. To this group of studies belongs also the monograph of a new subspecies L. persicae goidanichi, occurring in Italy. Each of these papers led to more general explanations of many biological observations of the genus Lecanium, such as parthenogenetic and bisexual reproduction of Lecaniidae, presence of 2 or 3 instar nymphs, viviparity and oviparity, mono- and polyphagy, and economic importance. The most comprehensive monograph of this kind deals with Lecanium corni Bouché (1958).

Another series of papers of Professor Kawecki concerned Sphaerolecanium prunastri (Fonsc.)(1968-1972). He gave an account on the interesting biological observations of this unusual species, as for example oviparous reproduction, hibernation in the first instars (in contradiction to other species which hibernate in second instars), the ratio betweeen males and females. He also warned of the possibility of Sphaerolecanium prunastri becoming a major plague in pomiculture, because of its progressing gradation.

As a keen observer, Prof. Kawecki noticed that the second pair of wings of male scales is a completely different structure and functions in entirely different ways than the halteres of Diptera. So he designated and justified the new name "tenter" /hamulohalterae/ for those organs (1962).

The image of Prof. Kawecki as a creator of Polish school of Coccidology wouldn't be full if the work of his disciples and collaborators - who have pursued studies upon the scale insects under his inspiration, his directions and with his help - was omitted. In this manner, so many new papers were published. Biological, morphological, taxonomic, faunal, anatomical, and histological studies were developed on a large scale. He also inspired and collaborated to develop many monographs about the distribution, evolution, and ecology of the Coccoidea and their parasites.

Currently this research is a critical part of our knowledge of the scale insects of Poland and of the World. His research is important not only to our knowledge of the scale insects of trees and shrubs, but also of the scales found in greenhouses, and of the scales living in such obscure habitats as the roots of their hosts. The close collaboration that the Professor began with world specialists years ago continues today and is a tribute to his dedication and enthusiasm for science.

The abovementioned are some of the lasting values which mark traces of Professor Kawecki's life. The finishing touch of Dr. Kawecki's long research work is the textbook "Applied Zoology" /1976, 1982/. It combines the results of his own research, his interest in history, and patriotism with the experiences of the didactic and pedagogue. Out of that school textbook emanates the pietism and noble proud of the national tradition. The author exposes the contribution of Polish scholars to the development of native and world natural science.

Despite the didactic and scientific activity, Professor Kawecki always found time to include himself into the current of civic life. He participated in scouting during the period of his youth, afterwards in illegal patriotic political organizations during the war. He lectured on the radio and expressed his views in the press. Professor Kawecki had never been indifferent toward political and social events.

He was a man of an uncommon mental calibre, of a great heart and character, gifted tutor of generations of teachers, farmers, and scientists. His merits to Polish science and culture are not transitory.

Anna Dziedzicka
ul. Podbrezie 3
31-054 Krakow
Biology Institute
High Pedagogical School
Poland

Alfred-Serge Balachowsky (1901-1983)

The founder President of IOBC, A. S. BALACHOWSKY, has passed away, at the end of a prolific career.

In Entomophaga, Pierre Grison has well recounted the main stages in his life as a researcher, editor and organizer. Here, I will just recall a few of the most engaging and perhaps, less well known sides of the outstanding personality of Balachowsky.

Firstly, it is necessary to emphasize his tremendous capacity for work and his remarkable powers of synthesis. In 1933, at the age of 32, he was bold enough, with P. Mesnil, to launch into the preparation of a colossal work of 2000 pages in 4 volumes: "Pest Insects of Cultivated Plants", which was published in 1935-1936. One sentence in the preface is especially revealing about the character and aspirations of Balachowsky. "Only patient research, undertaken with enthusiasm and optimism, with peace of mind and freedom, with no restraints or pressures, will enable one to overcome obstacles which at the time appear insurmountable."

When writing these lines where he earnestly evokes this freedom, did he conceive of the unfurling of Nazism in Europe? During the tragic years of the Second World War, his deeds were in perfect harmony with his thoughts, which were those also of his great friend Pierre LECOMTE DU NOUY: faith in the dignity of Man.

In 1941, he was presenting his entomology courses at the Grignon National Agricultural School, captivating his audience with his erudition and experience. At the same time, he was carrying on his functions as district head in the Resistance: Thanks to a transmitter hidden in the greenhouse at Grignon, he was in regular contact with London, and organized dropping of arms in the region. His little muddy 'Rosengart' which was parked in the School after each nocturnal outing used to puzzle us.

Betrayed by a spy in London, the Buckmaster-Prosper network was completely broken up at the beginning of July 1943, Balachowsky was imprisoned at Fresne, sent to Buchenwald and then immediately transferred to the hell of the Dora tunnel, where VI and V2's were made in great secret - secrecy being guaranteed by death of the prisoners.

Balachowsky's friends succeeded in getting him away from this hell with the help of a German anti-Nazi political prisoner, who had become the assistant of the mad and sadistic doctor SS Ding Schuler, head of the Institute of Hygiene, at the Buchenwald camp, where typhus vaccine was being made. Was not Balachowsky, as future head of department of the Pasteur Institute, the obvious choice to participate in this production? Having returned to Buchenwald looking like a skeleton, he regained his health by eating the autoclaved remains of rabbits which had been used in the vaccine preparation. Thanks to his unwavering energy, his intelligence, his defiance of danger and his powers of persuasion, he succeeded in saving from hanging Wing Commander Forest Yeo Thomas, special envoy of Churchill in France, as well as many of his friends. He first arranged for them to become human guinea-pigs of the mad doctor and then, passing them off as dead bodies, managed to have them transferred to other camps.

Throughout his long life, with the same perspicacity and spirit, Balachowsky addressed himself to problems which others believed to be insoluble; each time he succeeded in overcoming obstacles, and convincing his peers, imparting to them his faith in the work to be done. Today, we may be sure that, without his actions, IOBC would never have been born. Concurrently

with his constant preoccupation to place Entomology in the service of man, Balachowsky always remained loyal to the passion of being a biologist, to which he had aspired since childhood. His numerous expeditions took him to almost all parts of the world, from Japan to Burma, India to Iran and Lebanon, from Lapland to equatorial Africa, USA to Mexico, to Amazonia, Guyana and the Caribbean. His considerable number of publications bear witness to the importance and value of the material collected during his travels. In this respect, Balachowsky's work on the sytematics and biogeography of coccids will remain one of the pinnacles of his scientific achievements.

Whenever the occasion arose, he never hesitated to rebel against the discredit brought upon the discipline of systematics during the past 30 years when the emphasis in biology rested on molecular and biochemical studies, neglecting the basic concept: living organisms. Balachowsky will have been one of the most ardent defenders of fundamental studies on fauna and ecology, which are urgently required in view of the disappearance each year of innumerable species which still remain to be described; their elimination is resulting in an accelerated degradation of the natural environment of our planet under the combined effects of population explosion and increasingly destructive technical innovations.

Balachowsky will be recorded in history as one of the most eminent figures in French and world entomology in the Twentieth Century.

IOBC pays tribute to the memory of its founder and extends to his widow, Solange BALACHOWSKY, its deepest sympathy.

G. REMAUDIERE
Professor at the Pasteur Institute

This article was published in the IOBC Newsletter. It demonstrates some remarkable aspects of the man that many of us know on a different basis.

ed.

NOTES

The next International Symposium of Scale Insect Studies (V) will be held the last week of June 1986 in Portici, Italy (near Naples). The organizers are: E. Tremblay and A. Tranfaglia, Instituto di Entomologia Agraria, Universita di Napoli, 80055 - Portici, Italy. They will be happy to answer any of your questions about the meetings. Lets all plan to attend and make it as successful a meeting as the last.

ed.

Research on Cochineal Insects at Rhodes University, Grahamstown 6140 South Africa

"We are currently running a number of projects on cochineal insects (Dactylopius: Dactylopiidae), which are biocontrol agents introduced against cactus weeds in many parts of the world.
(a) Dispersal of female Dactylopius austrinus crawlers, and subsequent settling on the host plant, has been studied. The results of this research are to be published in Ecological Entomology, 7(4).

b) We have designed field trials to assess the affect that nutrient status of jointed cactus has on (i) settling success and fecundity of D. austrinus, and (ii) the ability of D. austrinus to destroy the host plant.

c) The role of carminic acid and the wax secretions of these insects as protection against coccinellid predators is being investigated.

d) We are studying the effect of carminic acid on development of parasitoid larvae.

e) We are also examining the structure and function of the peg-like setae and quinquelocular pores of a number of Dactylopius species in an attempt to understand the mechanics of wax formation in these insects.

f) One of us (H. G. Zimmerman, Weeds Laboratory, Plant Protection Research Institute, Uitenhage) has successfully presented his PhD thesis entitled 'The ecology of control of Opuntia aurantiaca in South Africa in relation to the cochineal insect Dactylopius austrinus'. A paper on some of his findings has been submitted to the Journal of Applied Ecology, and others are in preparation.

V. C. Moran H. G. Zimmermann G. H. Walter J. F. Morrison

TERMINOLOGY

During the meetings in Budapest, I promised to give examples of the sort of information that was compiled previously as basic data that could be used to standardize scale-insect systematic terminology. The following is such a compilation. The eriococcid terminology is my own. The pseudococcid terms were sent by Dr. John W. Beardsley in 1976. Neither compilation is intended to be exhaustive; rather they are the terms that are used and preferred by their respecive authors.

A committee on terminology was formed during the Budapest meetings. I will be happy to receive any contributions that you might wish to send for consideration by the committee. We would be most grateful for your help.

ed.

Eriococcidae

Adult Female

1. Bristle-shaped setae (body setae) - setae generally located ventrally, filiform in shape.

2. Enlarged setae - setae generally located dorsally and laterally, characteristic of many eriococcids. They differ from bristle-shaped setae in being much more robust.

3. Intermediate setae - setae occasionally found on the dorsal and lateral areas of ovaticoccins which are apparently intermediate in size and shape between bristle-shaped setae and enlarged setae.

4. Posterior anal-lobe setae - the longest seta located on each anal lobe or anal lobe area.

5. Anal-ring setae - the setae present on the sclerotization of the anal ring.

6. Sensory setae - setae located on the apical antennal segments which are thicker than the rest of the antennal setae.

7. Invaginated tubular duct - tubular duct with cup-shaped vestibule at end opposite dermal orifice.

8. Macrotubular duct - large-sized tubular duct with single sclerotized vestibule typical of invaginated tubular ducts.

9. Microtubular duct - small-sized tubular duct frequently with bisclerotic, non-invaginated vestibule.

10. Sessile pores - pores without sclerotized duct as in tubular ducts. Two primary types: multilocular pores, cruciform pores.

11. Multilocular pores - A circular structure that is divided into 3-12 loculi. The quinquelocular pore (with 5 loculi) is the most common on adult female eriococcids.

12. Derm granulations - small, sclerotized, toothlike projections scattered over derm, frequently located on ventromedial areas of abdomen and thorax.

13. Abdominal segmentation - abdominal segmentation schemes should be changed to conform with the systems of adult males and other scale families.

14. Anal lobes - on many eriococcids the anal-lobe area is developed into a rounded projection that has several enlarged and bristle-shaped setae.

15. Anal-lobe area - a small area of the derm at the posterolateral end of the body on each side of the anal ring which contains the socket of the posterior anal-lobe seta.

16. Anal ring - sclerotized, ringlike structure located near the posterior apex of the abdomen which frequently possesses many wax gland orifices sometimes called cells and several bristle-shaped setae.

17. Cellular anal ring - anal ring with wax gland orifices.

18. Non-cellular anal ring - anal ring without wax gland orifices.

19. vulva - genital opening of female located on venter between segments VIII & VII (VIII and IX of Ferris).

20. Mesosternal apophysis - small dermal invagination located between mesothoracic legs.

21. Microcruciform pores - simple pores on derm surrounding hind legs.

22. Translucent pores - small clear areas on surface of hind coxae and femur.

23. Trochanter sensoria - two small pores located on each surface of trochanter.

24. Tarsal digitules - a pair of setae that are capitate apically and are located on outerdistal margin of tarsus.

25. claw digitules - same as for tarsal digitules but located on inner-proximal margin of claw.

26. claw denticle - small tooth located on planter surface of claw.

27. cylpeus - basal part of mouth structure.

28. labium - segmented part of mouth structure, located posterior of clypeus (usually 3-segmented).

29. crumena - saclike structure containing stylets when not inserted into plant tissue.

Adult Male

1. Penial sheath - sclerotized apex of abdomen containing aedeagus.

2. etc.

University of Hawaii at Manoa
College of Tropical Agriculture
Department of Entomology
2500 Dole Street . Room 23 . Honolulu, Hawaii 96822

March 29, 1976

Dr. Douglass Miller
Insect Identification Laboratory
Agricultural Research Center
USDA, ARS
Beltsville, Maryland 20705

Dear Doug:

This is in reply to your letter of January 6, concerning your request soliciting lists of morphological terms utilized by coccid systematists. I have finally been able to go over the terms which I use in mealybug descriptions, at least. The list, with my comments concerning terms applied to various structures is attached herewith, along with illustrative diagrams.

I hope these will be helpful.

Sincerely,

John W. Beardsley

List of Terms, and Comments on Morphological Terminology
used for Descriptions of Scale Insects.

The following comments apply primarily to the family Pseudococcidae since most of my taxonomic work on scales has been with that group. Generally, I have followed the terminology employed by Ferris and McKenzie, as exemplified in the attached diagram. Some modifications of these terms appear to be needed as noted below. I would characterize the important morphological structures used in mealybug taxonomy as follows:

I. Ducts and Pores (these terms should be limited to orifices of hypodermal glands).
   A. Tubular ducts
      1. simple tubular ducts, ie: those without discernible internal or external thickening associated with orifice
      2. oral collar tubular ducts (= oral collar ducts)
      3. oral rim tubular ducts (= oral rim ducts)

Additional terminology on tubular ducts is needed to differentiate between types which are characteristic of different family groups, ie: the "truncate ducts" (with truncate inner apices) of pseudococcids vs. "vestibulate ducts" (those with cup-chaped vestibules) as found in Eriococcidae, Coccidae, etc. I am not in favor of subdividing tubular ducts on the basis of size alone, (eg: macroducts vs. microducts) unless structural differences other than size are evident. In mealybugs there appears to be a more or less continuous range in diameter of ducts, and therefore it would be very difficult to fix precise limits in such categories. When several size classes of ducts occur within a species measurements (ie: inside diameter of ducts) should be utilized to define size classes. (eg: "small oral collar tubular ducts, 6-8u inside diameter").

B. Pores
   1. Simple pores (non-loculate, ie: not divided by definite internal radial septa arranged in a definite geometric pattern). These are usually circular in outline.
      a. simple circular pores (small) to very small circular pores, without distinctly thickened rims - as found in many pseudococcids.
      b. simple disc pores (similar to a, but with thickened rims.
      c. sieve pores or sieve-like disc pores. The disc is very finely, possibly irregularly divided; no regular geometric pattern is discernible; typically expressed in sieve pores of Dysmicoccus brevipes. Is there any actual evidence that these structures are really pores? They may be sensory structures.
      d. large open center disc pores. This type occurs in some Margarodidae.
      e. Ring disc pores or ring pores. I propose this term for disc pores of the type found in Phaenacoleachia, where there appears to be a solid ring within the pore margin, and perhaps a small central loculus; see attached figure of P. anstralis.
   2. Loculate pores
      a. geminate pores. These are pores with paired simple orifices, generally 8-shaped as in Asterolecaniidae. Rarely occurs in Pseudococcidae. The term "germinate" may be preferable to "bilocular" as sometimes there appears to be a small central cell between the two large ones.
      b. triangular pores. Disc pores of roughly triangular outline.
         1) trilocular pores. Typically, the triangular, 3-loculate pores of pseudococcids.
         2) large triangular pores. Other types of triangular pores with more than 3 peripheral loculi, as in Phenacoleachia.

c. multilocular disc pores. Any roughly disc-shaped pore with recognizable number of discrete loculi. These can be further subdivided by reference to the number of loculi in the peripheral series ie:
   1) quadralocular disc pores. Characteristic of many adult male pseudococcids.
   2) Quinquelocular disc pores.
   3) sexlocular, octalocular, decalocular disc pores etc., as needed to specify number of loculi in the peripheral series; the single central loculus not being counter in deriving the same.

Where this system of nomenclature runs into trouble is in the Margarodidae and Ortheziidae where compound types, with two concentric series of loculi occur. These might be called "compound multilocular disc pores" and further defined, as needed, on basis of size (diameter) and numbers of loculi in inner and outer series.

3. Specialized non-sics pores.
   a. anal ring pores. The individual pores which make up the cellular anal ring in Pseudococcidae, etc.
   b. translucent pedalian pores. The small translucent spots (are they really pores?) found on the legs, particularly the metathoracic pair, in pseudococcids, etc.
   c. tubular pores. The type characteristic of Rhizoecus and its allies in which 2 or 3 small tubular ducts are borne on a small tubercle. These might have been better termed as "biductate tubercles" and "triductate tubercles", but the terms in current usage are:
      1) bitubular pores
      2) tritubular pores

II. Special Areas of the Derm.
   A. Cerarius - as defined by Ferris/McKenzie.
   B. Circulus (circuli). This apparently is an adhesive organ in Pseudococcids. Whether or not it is homologous with the "ventral cicatrices" which occur in many Margarodidae seems open to question. I would be in favor of staying with "circulus" for the Pseudococcidae, and using "cicatrix" for the various kinds of similar structures which occur on the venter in Margarodidae.
   C. Ventral sclerotized area of anal lobe.
   D. Ventral cephalic sclerotized area (in Rhizoecus and allies).

III. Setae and Spines.

The general definition of seta vs. spine, as defined by Snodgrass and others, should be followed in all coccid groups. That is, a seta may be variously hair-like, spine-like, peg-like, acorn-shaped, or even greatly expanded and scale-like (as in Paralecanium), but its base is always enclosed within a narrow membranous area surrounded by a fine sclerotized ring, which remains discernible even if the seta is broken off. Setae are basically trichoid sensilla. Spines, on the other hand, are generally rigid, outgrowths of the body wall, and are less common in coccids than setae, but do occur (as in Ortheziidae, Stictococcidae, etc.). The so-called gland spines of diaspidids are something else again (elongate, usually membranous, tubercles bearing gland orifices).

The descriptive terms applied to coccid setae usually designate both form (fine, conical, lanceolate, flabellate, fimbriate, digitiform, clavate, etc.) and position (cerarian, anal lobe, anal ring, marginal, dorsal body, etc). The tarsal, and tarsal claw digitules are special setae, as are the auxiliary setae of the cerarii in mealybugs, the stigmatic setae of Coccidae, etc. Most of these terms were used by Ferris/McKenzie. Ezzat and McConnell introduced the terms "cisanal" and "obanal" for two pairs of somewhat elongate setae

situated near the apex of the venter, below the anal ring in Pseudococcidae. I suggest the term "digitiform sensory setae" for the enlarged sensory setae of the antennae.

In addition to form and location, it is also important to give scme indication of size for setae. For mealybugs, I try to provide some indication of size range for each of the important types of setae which occur in a particular species.

With regard to the numbering of the segments of the abdomen in pseudococcids, I believe I have stated my view on this subject before. I believe that there is very strong morphological evidence for abandoning the Ferris/McKenzie numbering system which was based on the position of the gonopore in the neotenic females. I believe that the first abdominal segment is expressed, at least dorsally, in the pseudococcids, and that the abdominal dorsal osticles are located near the posterior margin of segment 6 in both sexes; the anal lobes are part of segment 8, and the female gonopore lies between segments 7 and 8. This interpretation will permit the homologizing of segmentation in Pseudococcidae with that of the Margarodidae, where segmentation can be accurately fixed by the positions of the abdominal spiracles.